

AMENDMENTS

Please amend the Application, as follows.

In The Claims

Please amend claims 4, 14 and 16, as shown in the APPENDIX A attached hereafter. The entire set of pending claims, including the clean version of the amended claim, is provided in the APPENDIX B attached hereafter.

REMARKS

In response to the Office Action dated November 14, 2002 and further to Applicants' Amendment under 37 C.F.R. §1.116 filed on January 14, 2003, claims 4, 14 and 16 has been amended. Claims 4, 5, 14-17 and 21 are active in this application, of which claims 4 and 14 are independent.

Entry of this Supplementary Amendments and Remarks is respectfully requested because entry of Amendment places the present application in condition for allowance, or in the alternative, better form for appeal. No new matters are believed to be added by this Amendments. Based on the above Amendments and the following Remarks, Applicants respectfully request that the Examiner reconsider the outstanding objections and rejections and they be withdrawn.

Rejections Under 35 U.S.C. §103

In the Office Action, claims 4 and 5 have been rejected under 35 U.S.C. §103(a) for being unpatentable over Japanese Patent Publication No. 08-254680 issued to Kubo, *et al.*

(“Kubo”) in view of U. S. Patent No. 6,219,125 issued to Ishikura, *et al.* (“Ishikura”). This rejection is respectfully traversed.

Amended claim 1 recites “A wire for a liquid crystal display, comprising: a wire layer made of either a metal or a metal alloy; a supplementary layer located either on or under said entire wire layer and made of either metal nitride or metal alloy nitride; and *a transparent electrode electrically connected to said wire layer*”.

Neither Kubo nor Ishikawa shows such features individually or in combination.

The primary reference to Kubo teaches a gate electrode (e.g., scanning line) Yn-1 that is formed below a gate insulating film 121 and *electrically and physically isolated* from any conductive wire layers on the gate insulating film 121. Thus, Kubo fails to teach or suggest a transparent electrode electrically connected to the gate electrode Yn-1.

Also, as the Examiner admits, Kubo “does *not* expressly teach the supplementary layer located either on or under the entire wire layer and made of either Mo-nitride or Mo-alloy nitride” (Office Action, page 2). The secondary reference to Ishikura is directed to forming a Mo nitride layer on or under principal electroconductive layer 12 made of a metal or metal nitride so as to work as *an adhesive layer* 11 (Fig. 2) and/or *a protection layer* 13 (Fig. 3), respectively.

Thus, even if the gate line Yn-1 of Kubo is modified such that the adhesive layer 11 or the protection layer 13 of Ishikura is formed on or under the molybdenum layer 13 in the gate electrode Yn-1, the resulting structure would still fail to show a transparent electrode electrically connected to the gate wire Yn-1.

Also, in Ishikura, the molybdenum nitride adhesive layer 11 and the molybdenum nitride protection layer 13 are provided to further increase *adhesiveness* between the glass substrate 2 and the metal electrode 3 and *surface roughness* of the metal electrode 3, respectively. The gate

electrode structure Yn-1 in Kubo has three layers are adhered together well enough to reduce wiring resistance. Also, the gate structure Yn-1 is protected by a gate insulating film 121. Thus, there is no motivation for combining the teachings of Kubo and Ishikura as asserted.

For these reasons, it would not have been obvious to combine the teachings of the applied reference to arrive at the claimed invention. Thus, claim 4 would be patentable over Kubo and Ishikura. Claim 5 that is dependent from claim 4 would be also patentable at least for the same reason. Accordingly, Applicants respectfully request that the rejection over claims 4 and 5 be withdrawn.

In the Office Action, claims 14-17 and 21 have been rejected under 35 U.S.C. §103(a) for being unpatentable over Applicants' Admitted Prior Art ("AAPA") in view of Kubo and further in view of Ishikawa. This rejection is respectfully traversed.

Amended claim 14 further recites "A liquid crystal display, comprising: ... a data wire made of one of either a metal or a metal alloy and formed on the gate insulating layer; a supplementary data wire located either on or under the entire data wire and made of either metal nitride or metal alloy nitride; *a passivation layer* formed on the data wire or the supplementary data wire and *covering said semiconductor layer*; and *a transparent electrode formed on the passivation layer and electrically connected to the data wire through a contact hole formed in the passivation layer*".

None of the references in the record shows such features individually or in combination.

AAPA fails to show the claimed feature of "a data wire made of one of either a metal or a metal alloy and formed on the gate insulating layer; a supplementary data wire located either on

or under the entire data wire and made of either metal nitride or metal alloy nitride”, as admitted by the Examiner.

As previously mentioned, the asserted combination of Kubo and Ishikura fails to show a transparent electrode electrically connected to the gate wire Yn-1, and there is no motivation for combining Kubo and Ishikura. Thus, it would not have been obvious to combine the teachings of AAPA, Kubo and Ishikura to arrive at the claimed invention.

Therefore, it is submitted that independent claim 14 is patentable over AAPA, Kubo and Ishikawa. Claims 15-17 and 21 that are dependent from claim 14 would be also patentable at least for the same reason. Accordingly, Applicants respectfully request that the rejection over claims 14-17 and 21 be withdrawn.

Other Matters

In this response, claim 16 has been amended to be consistent with the amendment made in claim 14.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete response has been made to the outstanding Office Action and, as such, claims 4, 5, 14-17 and 21 are in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Hae-Chan Park', written over the printed name.

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APPENDIX A

Please amend claims 4, 14 and 16, as follows.

4. (Three Times Amended) A wire for a liquid crystal display, comprising:
a wire layer made of either [molybdenum or molybdenum] a metal or a metal alloy; [and]
a supplementary layer located either on or under said entire wire layer and made of either
[molybdenum] metal nitride or [molybdenum] metal alloy nitride; and
a transparent electrode electrically connected to said wire layer.

14. (Three Times Amended) A liquid crystal display, comprising:
an insulating substrate;
a gate wire formed on the substrate;
a gate insulating layer covering the gate wire;
a semiconductor layer formed on said gate insulating layer;
a data wire made of one of either [molybdenum or molybdenum] a metal or a metal alloy
and formed on the gate insulating layer;
a supplementary data wire located either on or under the entire data wire and made of
either [molybdenum] metal nitride or [molybdenum] metal alloy nitride;
a passivation layer formed on the data wire or the supplementary data wire and covering
said semiconductor layer; and
a [pixel] transparent electrode formed on the passivation layer and electrically connected
to the data wire through a contact hole formed in the passivation layer.

16. (Three Amended) The liquid crystal display of 15, further comprising a supplementary gate wire which is located either on or under the gate wire and made of either [molybdenum] metal nitride or [molybdenum] metal alloy nitride.